

DART SERVICE INSTRUCTION

**TO AMEND INSTALLATION INSTRUCTIONS
IIN-D412-698 REV. E OR LATER APPROVED REVISION**

REF. TCCA STC: SH92-43
REF. FAA STC: SR01446NY
REF. EASA STC: EASA.IM.R.S.00709
REF. BRASIL STC: 2010S10-09

1.0 PURPOSE:

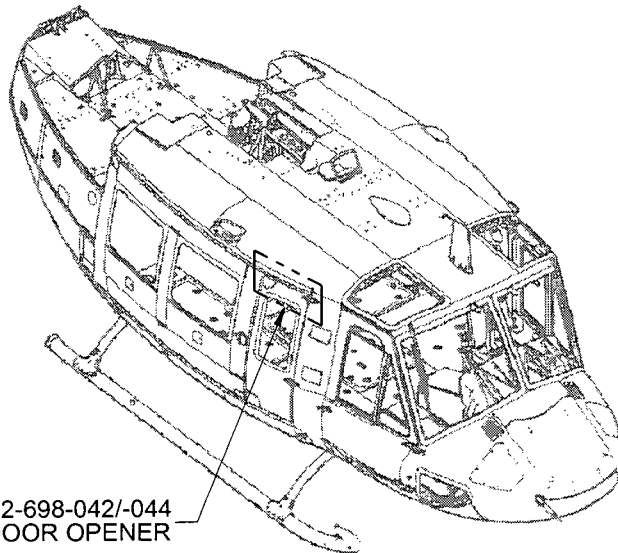
The purpose of this DSI is to add the optional automatic door opener kit for both the OEM aluminum (Bell P/N 205-031-423-005/-157/-006/-158), OEM composite (Bell P/N 412-030-029-101/-102), and Dart Spacedoor™ (Dart P/N D412-694-03/-04) hinge panel doors.

2.0 DESCRIPTION:

The Dart D412-698-XXX Hinge Panel Automatic Door Opener Kit permits the installation of a gas spring between the hinge panel doors (or "quarter" doors) and the cabin ceiling to prevent the doors from closing while the occupants enter or exit the aircraft.

The **D412-698-041 Hinge Panel Automatic Door Opener Kit** installs on the LH side of the aircraft and the **D412-698-042 Hinge Panel Automatic Door Opener Kit** installs on the RH side of the aircraft. These kits are designed to mount onto the OEM aluminum door (Bell P/N 205-031-423-005/-157/-006/-158).

The **D412-698-043 Hinge Panel Automatic Door Opener Kit** installs on the LH side of the aircraft and the **D412-698-044 Hinge Panel Automatic Door Opener Kit** installs on the RH side of the aircraft. These kits are designed to mount onto the OEM composite (Bell P/N 412-030-029-101/-102) and Dart Spacedoor™ (Dart P/N D412-694-03/-04).



LOCATION OF D412-698-042/-044
AUTOMATIC DOOR OPENER

FIGURE 1: LOCATION OF HINGE PANEL AUTOMATIC DOOR OPENER KITS

(RH Installation Shown, LH Opposite)

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| DATE: | 12.08.30 |
| CERT. NO.: | SH92-43 |
| ISSUE NO.: | 5 |

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|---|---|--|----------|
| C | D412-698-043/-044 NOW COMPATIBLE FOR INSTALLATION ON OEM COMPOSITE DOORS | MB | 12.08.29 |
| B | ADDED NOTE TO TRIM EXISTING TRIM/CEILING PANELS: ITEMS 11/12 OF SECTIONS 3.0/4.0 (SHT 2/4); UPDATED FIGURE 3 ACCORDINGLY. REF: PAR11-150. | MB | 12.01.17 |
| A | NEW ISSUE | DC | 11.04.26 |
| REV. | DESCRIPTION | BY | DATE |
| DESIGN | <i>[Signature]</i> | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| DRAWN | <i>[Signature]</i> | DRAWING NO. REV. C | |
| CHECKED | A.P. | DSI 9548 SHEET 1 OF 9 | |
| MFG. APPR. | N/A | TITLE SCALE | |
| APPROVED | <i>[Signature]</i> | HINGE DOOR OPENER KIT NTS | |
| DE APPR. | <i>[Signature]</i> | DATE 12.08.29 | |
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3.0 INSTALLATION OF D412-698-041/-042 HINGE PANEL AUTOMATIC DOOR OPENER (OEM ALUMINUM DOOR):

NOTE: The following instructions are for a typical RH side installation. For installation on the LH side, substitute D4330-041 for D4330-042.

1. Remove any ceiling or trim panels located on the RH foward cabin ceiling. Remove existing door spring Bell p/n 205-030-303-101 and associated hardware.
2. Using Figures 2 and 3 and dimensions shown as reference, locate D4330-042 Airframe Bracket Assembly, RH on the intersection of the existing aircraft rivet lines. The angled part of D4330-042 Airframe Bracket Assembly, RH is required to pick up on a minimum of 3 rivets. The bracket may be hand formed as necessary to improve fit with the contoured ceiling.
3. Mark the location of D4330-3 Door Bracket on the Hinge Panel Door as shown in Figure 4.
4. Verify that the D3552-21 Gas Spring will close properly (0.25" travel before it is fully retracted) when the door is closed. Adjust the position of the D4330-042 Airframe Bracket Assembly, RH if required to maintain rivet edge distance.
5. Verify that the D3552-21 Gas Spring will open the door to the desired position. Ensure the Gas Spring does not interfere with the door or airframe. Adjust location of D4330-3 Door Bracket if required.
NOTE: When the door is fully open, it should be approximately perpendicular to the aircraft.
6. Remove the 205-031-423-005/-157/-006/-158 aluminum door from the aircraft per the Aircraft Maintenance Manual.
7. Remove any existing rivets where the D4330-042 Airframe Bracket Assembly, RH and D4330-3 Door Bracket will be installed.
8. Locate D4330-042 Airframe Bracket Assembly, RH on the aircraft ceiling per Figure 3. Transfer drill #30 ($\phi 0.129$ ") holes from the ceiling to D4330-042. Deburr holes.
9. Locate D4330-3 Door Bracket on the hinge panel door per Figure 4. Using Figure 5 as a guide for the approximate locations of the mounting holes, transfer drill 3x #30 ($\phi 0.129$ ") holes from the door skin to D4330-3 and drill 2x additional holes at locations shown in Figure 5. Deburr holes.
10. Apply a thin layer of Proseal 890 (or equivalent) to faying surface of the D4330-042/-3 brackets. Install the D4330-042 Airframe Bracket Assembly, RH using CR3213-4 rivets as shown in Figure 3. Install D4330-3 Door Bracket using CR3213-4 rivets as shown in Figure 4.
11. Pre-install the ceiling or trim panels that were removed in Step 1 and transfer mark contour of D4330-041 or -042 as shown in Figure 3 (SHT 6). Remove ceiling or trim panels and perform cutout to clear D4330-041 or -042. Touch-up finish of ceiling or trim panels cutout area in accordance with aircraft maintenance manual and re-install any ceiling or trim panels.
12. Install a D3622-1 Ball Stud on the D4330-3 Door Bracket using hardware specified in Figure 4.
13. Re-install modified door on aircraft per Aircraft Maintenance Manual.
14. Install D3552-21 Gas Spring onto the D3622-1 Ball Studs per Figure 2.
15. Verify proper gas spring and door operation.

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


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4.0 INSTALLATION OF D412-698-043/-044 HINGE PANEL AUTOMATIC DOOR OPENER (OEM COMPOSITE):

NOTE: The following instructions are for a typical RH side installation. For installation on the LH side, substitute D4330-041 for D4330-042.

1. Remove any ceiling or trim panels located on the RH forward cabin ceiling. Remove existing door spring Bell p/n 205-030-303-101 and associated hardware.
2. Using Figures 2 and 3 and dimensions shown as reference, locate D4330-042 Airframe Bracket Assembly, RH on the intersection of the existing aircraft rivet lines. The angled part of D4330-042 Airframe Bracket Assembly, RH is required to pick up on a minimum of 3 rivets. The bracket may be hand formed as necessary to improve fit with the contoured ceiling.
3. Mark the location of D4330-3 Door Bracket on the hinge panel door as shown in Figure 6.
4. Verify that the D3552-21 Gas Spring will close properly (0.25" travel before it is fully retracted) when the door is closed. Adjust the position of the D4330-042 Airframe Bracket Assembly, RH if required to maintain rivet edge distance.
5. Verify that the D3552-21 Gas Spring will open the door to the desired position. Ensure the Gas Spring does not interfere with the door or airframe. Adjust location of D4330-3 Door Bracket if required.
NOTE: When the door is fully open, it should be approximately perpendicular to the aircraft.
6. Remove the 412-030-029-101/-102 composite door from the aircraft per the Aircraft Maintenance Manual.
7. Remove any existing rivets, if any, where the D4330-042 Airframe Bracket Assembly, RH will be installed.
8. Locate D4330-042 Airframe Bracket Assembly, RH on the aircraft ceiling per Figure 3. Transfer drill #30 ($\phi 0.129$ ") holes from the ceiling to D4330-042. Deburr holes.
9. Locate D4330-3 Door Bracket on the hinge panel door per Figure 6. Using Figure 7 as a guide for the approximate locations of the mounting holes, drill 3x #7 ($\phi 0.201$ ") holes in D4330-3 and the inner door skin. Enlarge holes in hinge panel door inner skin to 9/16" ($\phi 0.5625$ ").
10. Install the 3x 80-005-2-8 inserts per Paragraph 3.2.12 of the BHT-MED-SRM at the locations drilled in Step 9 in the hinge panel door using Hysol EA934NA.
11. Apply a thin layer of Proseal 890 (or equivalent) to faying surface of the D4330-042/-3 brackets. Install the D4330-042 Airframe Bracket Assembly, RH using CR3213-4 rivets as shown in Figure 3. Install D4330-3 Door Bracket using hardware as shown in Figure 6.
12. Pre-install the ceiling or trim panels that were removed in Step 1 and transfer mark contour of D4330-041 or -042 as shown in Figure 3 (SHT 6). Remove ceiling or trim panels and perform cutout to clear D4330-041 or -042. Touch-up finish of ceiling or trim panels cutout area in accordance with aircraft maintenance manual and re-install any ceiling or trim panels.
13. Install a D3622-1 Ball Stud on the D4330-3 Door Bracket using hardware specified in Figure 6.
14. Re-install modified door on aircraft per Aircraft Maintenance Manual.
15. Install D3552-21 Gas Spring onto the D3622-1 Ball Studs per Figure 2.
16. Verify proper gas spring and door operation.

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5.0 INSTALLATION OF D412-698-043/-044 HINGE PANEL AUTOMATIC DOOR OPENER (DART SPACEDOORS™):

NOTE: The following instructions are for a typical RH side installation. For installation on the LH side, substitute D4330-041 for D4330-042.

1. Remove any ceiling or trim panels located on the RH forward cabin ceiling. Remove existing door spring Dart p/n D3113-1 and associated hardware.
2. Using Figures 2 and 3 and dimensions shown as reference, locate D4330-042 Airframe Bracket Assembly, RH on the intersection of the existing aircraft rivet lines. The angled part of D4330-042 Airframe Bracket Assembly, RH is required to pick up on a minimum of 3 rivets. The bracket may be hand formed as necessary to improve fit with the contoured ceiling.
3. Mark the location of D4330-3 Door Bracket on the Spacedoor™ as shown in Figure 6.
4. Verify that the D3552-21 Gas Spring will close properly (0.25" travel before it is fully retracted) when the door is closed. Adjust the position of the D4330-042 Airframe Bracket Assembly, RH if required to maintain rivet edge distance.
5. Verify that the D3552-21 Gas Spring will open the door to the desired position. Ensure the Gas Spring does not interfere with the door or airframe. Adjust location of D4330-3 Door Bracket if required.
NOTE: When the door is fully open, it should be approximately perpendicular to the aircraft.
6. Remove the D412-694-03/-04 Door Assembly from the aircraft per ICA-D412-694 Section 52.1.
7. Remove any existing rivets where the D4330-042 Airframe Bracket Assembly, RH will be installed.
8. Locate D4330-042 Airframe Bracket Assembly, RH on the aircraft ceiling per Figure 3. Transfer drill #30 ($\phi 0.129$ ") holes from the ceiling to D4330-042. Deburr holes.
9. Locate D4330-3 Door Bracket on the Spacedoor™ per Figure 6. Using Figure 7 as a guide for the approximate locations of the mounting holes, drill 3x #7 ($\phi 0.201$ ") holes in D4330-3 and the inner door skin. Enlarge holes in Spacedoor™ inner skin to 9/16" ($\phi 0.5625$ ").
10. Install the 3x 80-005-2-8 inserts per Paragraph 3.2.12 of the BHT-MED-SRM at the locations drilled in Step 9 in the Spacedoor™ using Hysol EA934NA.
11. Apply a thin layer of Proseal 890 (or equivalent) to faying surface of the D4330-042/-3 brackets. Install the D4330-042 Airframe Bracket Assembly, RH using CR3213-4 rivets as shown in Figure 3. Install D4330-3 Door Bracket using hardware as shown in Figure 6.
12. Pre-install the ceiling or trim panels that were removed in Step 1 and transfer mark contour of D4330-041 or -042 as shown in Figure 3 (SHT 6). Remove ceiling or trim panels and perform cutout to clear D4330-041 or -042. Touch-up finish of ceiling or trim panels cutout area in accordance with aircraft maintenance manual and re-install any ceiling or trim panels.
13. Install a D3622-1 Ball Stud on the D4330-3 Door Bracket using hardware specified in Figure 6.
14. Re-install modified door on aircraft per ICA-D412-694 Section 52.2.
15. Install D3552-21 Gas Spring onto the D3622-1 Ball Studs per Figure 2.
16. Verify proper gas spring and door operation.

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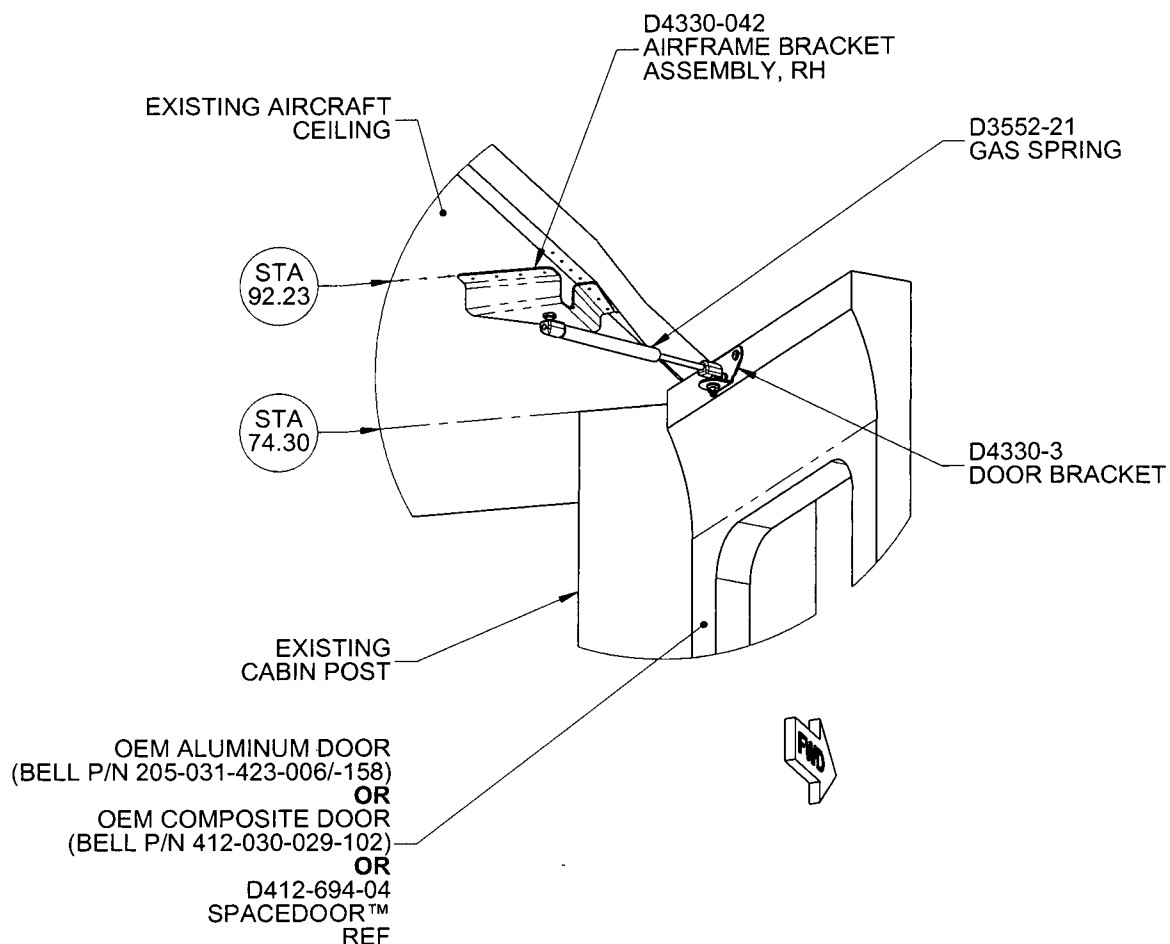


FIGURE 2: INSTALLATION DETAIL
(RH Installation Shown, LH Opposite)

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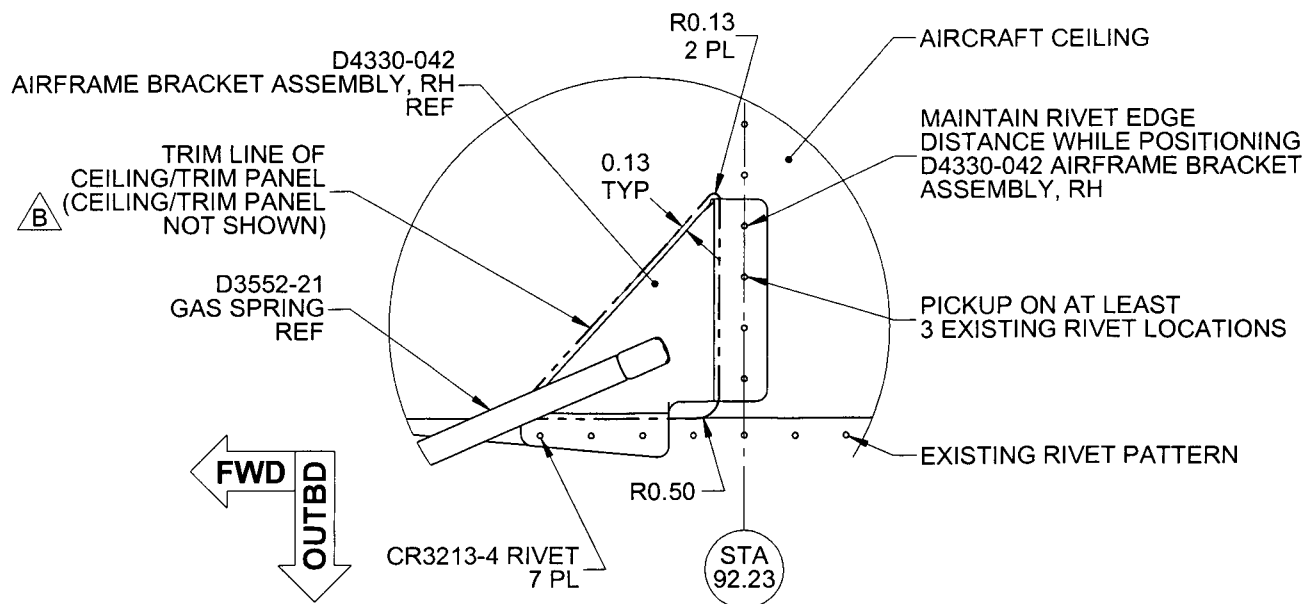


FIGURE 3: LOCATION OF D4330-042 AIRFRAME BRACKET ASSEMBLY
(RH Shown, LH Opposite)

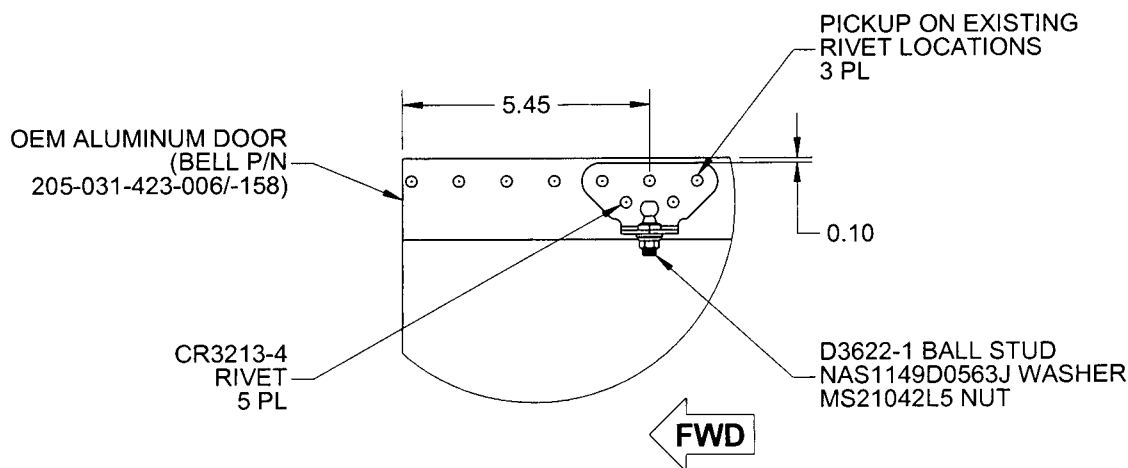






FIGURE 4: LOCATION OF D4330-3 DOOR BRACKET
(OEM ALUMINUM DOOR)
(RH Shown, LH Opposite)

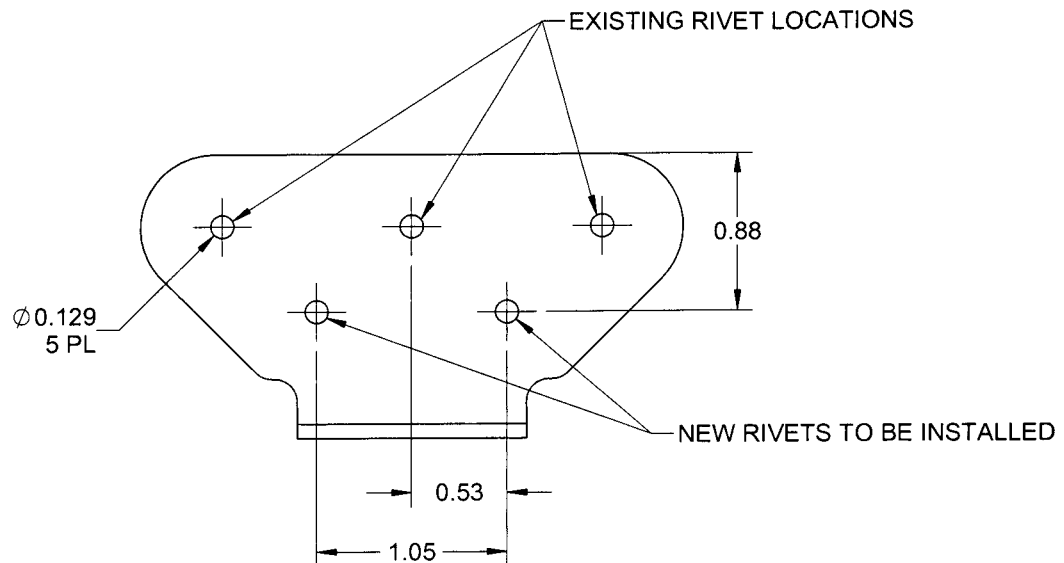
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**FIGURE 5: LOCATION OF D4330-3 DOOR BRACKET MOUNTING HOLES
(OEM ALUMINUM DOOR)**

(NOTE: MAINTAIN MINIMUM EDGE DISTANCE OF 0.25" FROM HOLE CENTER)

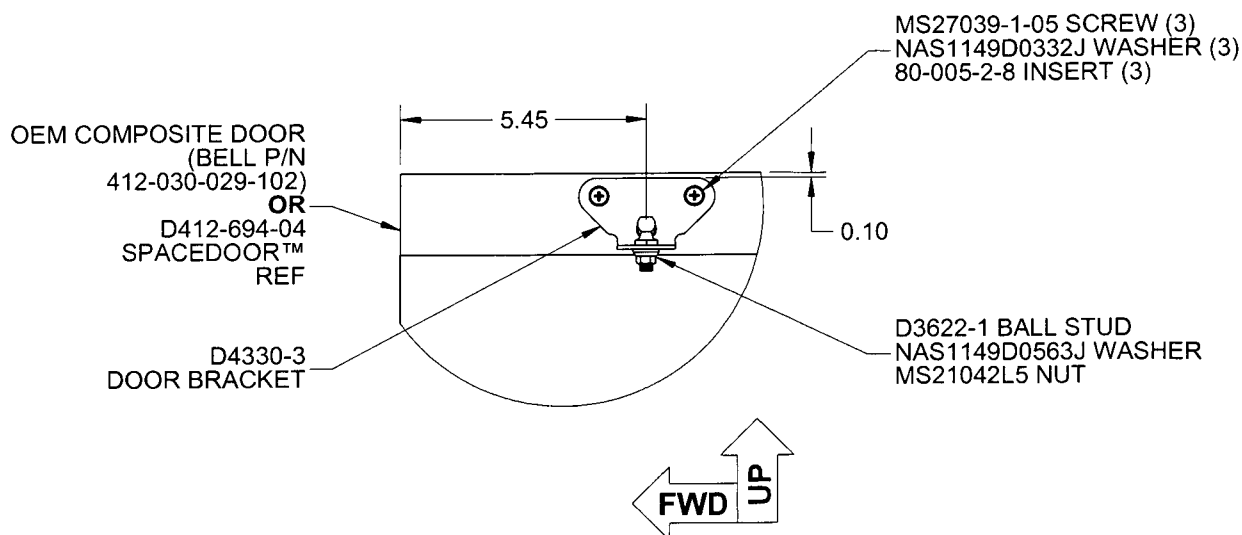
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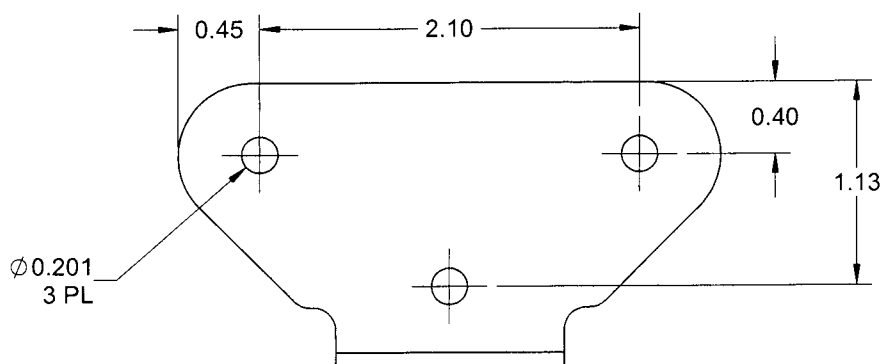
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**FIGURE 6: LOCATION OF D4330-3 DOOR BRACKET
(OEM COMPOSITE DOOR AND DART SPACEDOOR™)**
(RH Shown, LH Opposite)







**FIGURE 7: LOCATION OF D4330-3 DOOR BRACKET MOUNTING HOLES
(OEM COMPOSITE DOOR AND DART SPACEDOOR™)**

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5.0 WEIGHT & BALANCE:

| INSTALLATION | WEIGHT | LATERAL | | LONGITUDINAL | |
|-------------------------------------|--------------------|----------------------|----------------------------|--------------------|--------------------------|
| | | Arm | Moment | Arm | Moment |
| D412-698-041 LH (Aluminum door) | 0.23 lb 0.10 kg | -43.63 in -1.11 m | -10.03 in-lb -0.11 m-kg | 86.27 in 2.19 m | 19.84 in-lb 0.22 m-kg |
| D412-698-042 RH (Aluminum door) | 0.23 lb 0.10 kg | 43.63 in 1.11 m | 10.03 in-lb 0.11 m-kg | 86.27 in 2.19 m | 19.84 in-lb 0.22 m-kg |
| D412-698-043 LH (Composite door) | 0.23 lb 0.10 kg | -43.63 in -1.11 m | -10.03 in-lb -0.11 m-kg | 86.27 in 2.19 m | 19.84 in-lb 0.22 m-kg |
| D412-698-044 RH (Composite door) | 0.23 lb 0.10 kg | 43.63 in 1.11 m | 10.03 in-lb 0.11 m-kg | 86.27 in 2.19 m | 19.84 in-lb 0.22 m-kg |
| D412-698-043 LH (Spacedoor™) | 0.23 lb 0.10 kg | -43.63 in -1.11 m | -10.03 in-lb -0.11 m-kg | 86.27 in 2.19 m | 19.84 in-lb 0.22 m-kg |
| D412-698-044 RH (Spacedoor™) | 0.23 lb 0.10 kg | 43.63 in 1.11 m | 10.03 in-lb 0.11 m-kg | 86.27 in 2.19 m | 19.84 in-lb 0.22 m-kg |

6.0 PARTS LIST:

| Qty -041 | Qty -042 | Qty -043 | Qty -044 | Part Number | Description |
|-------------|-------------|-------------|-------------|---------------|---|
| X | | | | D412-698-041 | HINGE PANEL AUTOMATIC DOOR OPENER KIT, LH (FOR OEM ALUMINUM DOOR) |
| | X | | | D412-698-042 | HINGE PANEL AUTOMATIC DOOR OPENER KIT, RH (FOR OEM ALUMINUM DOOR) |
| | | X | | D412-698-043 | HINGE PANEL AUTOMATIC DOOR OPENER KIT, LH (FOR OEM COMPOSITE DOOR AND DART SPACEDOOR™) |
| | | | X | D412-698-044 | HINGE PANEL AUTOMATIC DOOR OPENER KIT, RH (FOR OEM COMPOSITE DOOR AND DART SPACEDOOR™) |
| 1 | 1 | 1 | 1 | D3552-21 | GAS SPRING |
| 1 | 1 | 1 | 1 | D3622-1 | BALL STUD |
| 1 | | 1 | | D4330-041 | AIRFRAME BRACKET ASSEMBLY, LH |
| | 1 | | 1 | D4330-042 | AIRFRAME BRACKET ASSEMBLY, RH |
| 1 | 1 | 1 | 1 | D4330-3 | DOOR BRACKET |
| | | 3 | 3 | 80-005-2-8 | INSERT |
| 1 | 1 | 1 | 1 | MS21042L5 | NUT |
| | | 3 | 3 | MS27039-1-05 | SCREW |
| | | 3 | 3 | NAS1149D0332J | WASHER |
| 1 | 1 | 1 | 1 | NAS1149D0563J | WASHER |

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| DESIGN | <u>DC</u> | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | DRAWING NO. DSI 9548 | REV. C SHEET 9 OF 9 |
| DRAWN | <u>B</u> | | | |
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